RESEARCH PROGRAM ON Livestock and Fish

CGIAR

More meat, milk and fish by and for the poor

Analysis of sheep value chains in Menz Gera district, North Shewa zone, Ethiopia

T. Beneberu[1], G. Shenkute[1], J. Wamatu[2], and G. Solomon[3]

[1] Debre Birhan Agricultural Research Center, Ethiopia
[2] International Center for Agricultural Research in the Dry Areas (ICARDA)
[3] International Livestock Research Institute (ILRI)

www.livestockfish.cgiar.org
December 2013

ICARDA WorldFish ILRI CIAT

CGIAR is a global partnership that unites organizations engaged in research for a food secure future. The CGIAR Research Program on Livestock and Fish aims to increase the productivity of small-scale livestock and fish systems in sustainable ways, making meat, milk and fish more available and affordable across the developing world. The Program brings together four CGIAR Centers: the International Livestock Research Institute (ILRI) with a mandate on livestock; the WorldFish Center with a mandate on aquaculture; the International Center for Tropical Agriculture (CIAT), which works on forages; and the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants.

Citation: Beneberu, T., Shenkute, G., Wamatu, J. and Solomon, G. 2013. Analysis of sheep value chains in Menz Gera district, North Shewa zone, Ethiopia. Addis Ababa: ICARDA.

ICARDA and ILRI are members of the CGIAR Consortium

ICARDA
Box 5689, Addis Ababa, Ethiopia
Phone: +251-11-617-2281
Fax: +251-11-617 2001
E-mail: S.Silim@cgiar.org

ILRI
Box 5689, Addis Ababa, Ethiopia
Phone: +251 11 617 2000
Fax: +251 11 617 2001
Email: ILRI-Ethiopia@cgiar.org

Table of Contents

Acronyms

AHP	Animal health post
AI	Artificial Insemination
CAHW	Community Animal Health Worker
CSA	Central Statistics Authority
DA	Development Agent
EMDTI	Ethiopian Meat and Dairy Technology Institute
DBARC	Debre Birhan Agricultural Research Center
ETB	Ethiopian birr
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FMD	Foot and mouth disease
FTC	Farmers' Training Center
GDP	Gross Domestic Product
HCS	Hararghe Catholic Secretariat
ICARDA	International Center for Agricultural Research in Dry Areas
ILRI	International Livestock Research Institute
MFI	Microfinance Institution
MIS	Market Information System
MoARD	Ministry of Agriculture and Rural Development
PTC	Pastoralists' Training Center
PRIME	Pastoralist Areas Resilience Improvement and Market Expansion
SCUK	Save the Children UK
ESoRPARI	Ethiopian Somali Regional Pastoral and Agro-Pastoral Research Institute
SRS	Somali Regional State
USAID	United States Agency for International Development

Foreword and acknowledgements

In mid-2012, stakeholder discussions and planning for the Livestock and Fish small ruminant value chain development project were initiated by the International Center for Agricultural Research in the Dry Areas (ICARDA), the International Livestock Research Institute (ILRI) and national partners.

After selecting eight research sites meeting various criteria, the first step was to conduct rapid value chain assessments in each site. In November 2012, national teams were formed and trained to carry out these assessments (including for the associated 'safe food fair food' project). Field implementation of the rapid value chain analysis took place in December 2012 and January 2013 with mixed teams comprising staff from CGIAR and national organizations. The teams used a toolkit developed through the Program and undertook focus group discussions with farmers using checklists and participatory methods as well as key informant interviews with local experts, traders, butchers, livestock researchers, transporters, veterinarians and NGOs.

The preliminary reports from these assessments were reviewed at three multi-stakeholder workshops held in March and April 2013. In these workshops, participants from research and development partners validated the value chain analysis and formulated initial 'best bet' intervention plans for each of the sites.

These activities are documented at http://livestockfish.cgiar.org/category/countries/ethiopia/

The following people contributed to this process:

- Barbara Rischkowsky ICARDA
- Jane Wamatu ICARDA
- Halima Hassen ICARDA
- Aden Aw-Hassan ICARDA
- Aynalem Haile ICARDA
- Getachew Legese ICARDA
- Tadelle Dessie ILRI
- Solomon Gizaw ILRI
- Peter Ballantyne ILRI
- Alan Duncan ILRI
- Berhanu Gebremedhin ILRI
- Hikuepi Katjiuongua ILRI
- Kathleen Colverson ILRI
- Tamsin Dewe ILRI
- Zerihun Sewunet ILRI
- Getnet Assefa EIAR
- Yeshi Chiche EIAR
- Asrat Tera SARI
- Nigussie Dana SARI

Introduction

Smallholder sheep-keepers are an integral part of the livestock sub-sector and livestock enterprises contribute to both household consumption and cash income generation (Shapiro 1991, EARO 2000, Ehui et al. 2000).

Although farmers sell animals of varying sex, age and weight, yearlings are the dominant type, sold usually to cover immediate cash needs before they attain their mature body weight. In most instances, the farmers benefit little from the sale of these sheep. This is mainly because yearling sheep are seldom conditioned (or 'finished') using supplementary feed. In addition, a lack of market information and low market prices further lower the benefits accrued by farmers. Farmers usually sell their sheep at the 'farm gate' and on market days at nearby markets. Indigenous sheep breeds are adapted to survive and produce under adverse local environmental conditions (caused by climatic stress, poor quality feed, seasonal feed and water shortages, endemic disease and parasite challenge) and this makes them suitable for the traditional, low-external-input production systems dominant in Ethiopia (IBC 2004).

At the same time, it is not uncommon to see piles of crop residues on farms and farmers are well aware of the monetary and feed value of crop residues. Alternative feed resources and improved marketing channels are the key to increasing farm income from the sale of sheep.

Objectives

The objective of the study was to characterize the sheep value chain in order to identify intervention points in Menz Gera district. Specific objectives were:

- To identify opportunities and challenges that influence sheep value chain development
- To evaluate whether improvements can be made
- To document important elements and modalities of market strategies and to recommend future development and research intervention areas.

This study

This study contributes to the Ethiopian small ruminant value chain development project of the CGIAR Research Program (CRP) on Livestock and Fish. It is being implemented in eight target districts throughout the country. For each site a team was formed to conduct a rapid value chain analysis (VCA) using a toolkit developed by an ICARDA-ILRI team and researchers from the partner centers (http://livestock-fish.wikispaces.com/VCD+Ethiopia). In addition to the site reports, the national team prepared a synthesis report incorporating the findings from all eight sites (http://livestockfish.cgiar.org/focus/ethiopia/). The synthesis report also includes the conceptual framework and describes the general methodology applied for the rapid value chain analysis.

Study area

The study was conducted in Menz Gera Midr district (Figure 1), which is located 283 km northeast of Addis Ababa on the road to Dessie. The district covers 1,644 square km of land and has a population of 121,676. The topography consists of flat plain (39%), mountain (25%), gorge (12.8%), undulated land (23%) and water bodies (0.2%).

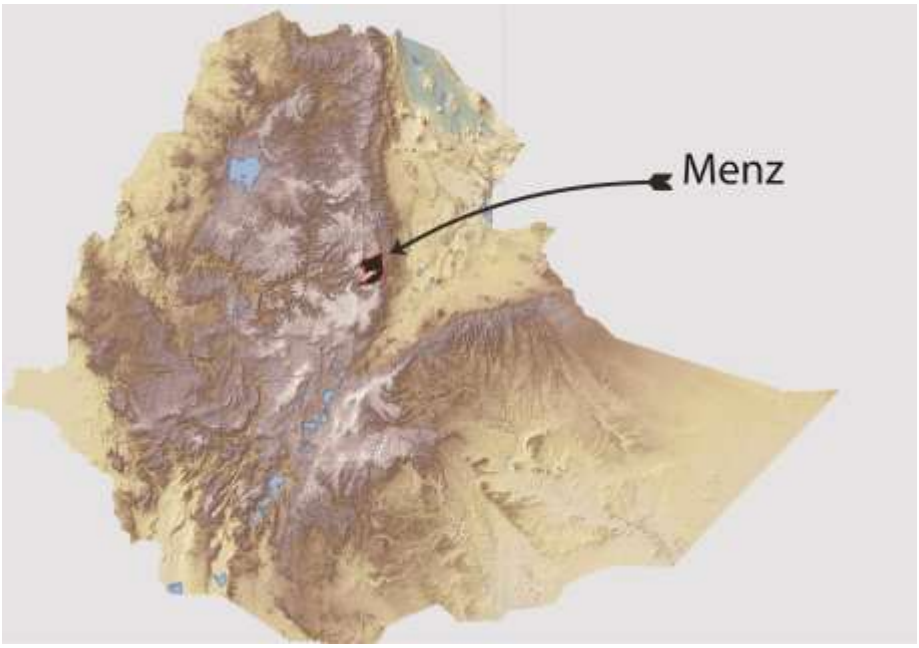

Figure 1. The study area

Annual rainfall, which is distributed bi-modally, ranges from 900 to 1000 mm per year. The altitude ranges from 2800 to 3100 metres above sea level (masl). The major crops by coverage are barley (52%), wheat (23%), beans (15%) and others (10%). The district is known for its small ruminant population, having about 200,500 sheep and 63,500 goats.

Data collection and analysis

Both primary and secondary data were collected using a combination of techniques. Participatory rural appraisal (PRA), focus group discussions, key informant interviews and visual observations were used to collect primary data. Secondary data were collected from district offices, the Central Statistical Authority (CSA) and Debre Berhan Agricultural Research Center (DBARC). Relevant literature and documents were also reviewed to provide the theoretical background.

Two kebeles were selected for a separate focus group discussions (FGD). Twelve men and three women were represented per each kebele (neighbourhoods). The groups were balanced regarding economic status, age and educational level. Each question was thoroughly discussed and the consensus reached by the group was taken as the best information.

Key informant Interviews were conducted with livestock extension agents, livestock marketers, cooperative promotion experts, abattoir managers, traders, supermarket meat managers, butchers, livestock researchers, transporters and veterinarians. Sheep traders in the primary and secondary/intermediate markets of the district were also interviewed. The team also held discussions with managers from Luna Export Abattoir, to represent the terminal/export market.

Data were analyzed using a thematic analysis approach. Quantitative data were analyzed using descriptive statistical analysis techniques to calculate the distribution of costs and margins along the sheep and feed value chains.

Results: Core functions in the sheep value chain

The core functions in the sheep value chain are input supply, production, trade (marketing), processing and consumption (see Figure 2).

	Input supply	Production	Marketing	Processing	Consumption
Activities	Supply of: • Feed • Breeding rams • Veterinary drugs • credit services	• Feeding • Herding • Housing • Rearing • Fattening	• Collection • Intermediation • Transportation • Distribution	• Slaughtering • Cutting and packing	• Consuming
Actors	• Research • Multiplication centers • Traders • District Agricultural Rural Development • Amhara Credit and Saving Institute (ACSI)	• Farmers • Cooperatives	• Producers • Brokers • Traders • Agents of export abattoirs	• Butchers • Supermarkets • Export abattoirs	• Consumers

Figure 2. Core functions, activities and actors in the sheep value chain

Input supply

Input supply for sheep production includes supply of breeding rams, veterinary drugs and services, feed and credit.

Supply of improved breeding rams

The main breed available in the study area is the local Menz breed, which is characterized by its ability to withstand the dry season and to survive and produce under adverse local environmental conditions (climatic stress, poor quality feed, seasonal feed and water shortages, endemic disease and parasite challenge). These animals often show poor body condition and hence attract low market prices. Generally rams are sourced from the producer's own flock and breeding is through natural mating. All farmers use local rams for breeding and fattening for sale. There is no role for cooperatives or other agencies in the supply of improved or proven rams.

Animal health service

Improving animal health services is one of the keys to more profitable sheep production. There is one clinic for the district and one health post for three kebeles. There is only one veterinary expert for three kebeles. This means that one veterinary expert will serve on average 1200 households, with about 10–15 sheep per household. Furthermore, farmers have to travel long distances (5–7 km) with their animals to seek veterinary services.

Animal feed

Sources of animal feed in the area are natural grazing, hay, crop residues and oats. Some improved forage planting materials, such as phalaris grass and tree lucerne, have been supplied by the District Agricultural Office.

Farmers feed crop residues to cattle and equines, whereas hay is provided only to cattle. The seasons for feed purchases and sales are indicated in Table 1. Crop residues are purchased at crop harvesting season (December–March) and sold when there is feed scarcity (April–August). Hay sales take place mainly from September to November. Concentrates are bought from December to June. Concentrates are not purchased during the rainy season (July–November) since at this time feed availability is improving and farmers are generally short of cash.

Table 1. Feed purchasing and selling seasons in the study area

Action	Feed type	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
Purchasing	Crop residues	XXX	XXX	XX	X	X	X						XXX
	Hay									XX	XX	X	
	Concentrate	XX	XX	XX	XX	X	X						XX
Selling	Crop residues				XX	XX	XX	X X	XX				
	Hay									XX	XX	X	

Note: X = scarce, XX = available, XXX = abundant

Production

Farmers produce sheep primarily for sale and occasional slaughter at home for household consumption. The average flock size usually maintained by households in the study area is about 20 and flock sizes are increasing due to growing demand for sheep meat. On average, around 15% of the flock is slaughtered for household consumption and around 50% for sale at market. The balance (35%) is kept as breeding stock (Figure 3).

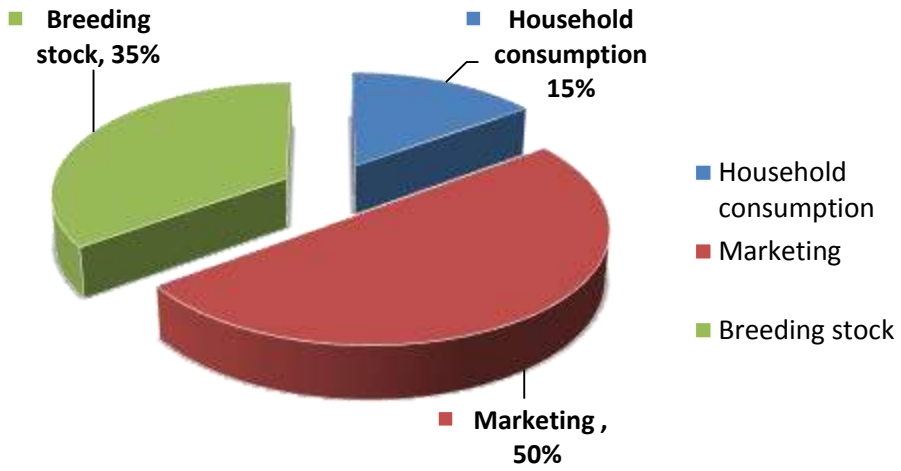

Figure 3. Sheep utilization

Marketing

Farmers sell their sheep to anyone who pays an acceptable price and the buyers are mainly other farmers, traders and final consumers. Yearlings of both sexes are sold to market when farmers are in need of cash. Farmers have to travel (on foot) for 2–3 hours to reach the market. They collect market information one week before (for price, type of product required and quantity demanded) from neighbours, friends and traders and/or by inspecting the situation in the market on market day.

Market locations and routes

Farmers sell their sheep at the 'farm gate' or the nearest local/primary markets. Farmers and other market actors use all the markets in their localities regardless of political boundaries and ethnic and cultural differences. We can recognize three types of markets, namely primary, secondary/ intermediary and tertiary/terminal markets. The number of market actors participating depends on the level/type of markets. Markets with good facilities and access (road, communications, etc.) will have more participants. The volume of flow of sheep from one market to another depends on seasonality, i.e. festivals, feed availability, level of markets, market actors involved. Figure 4 shows the major market places and routes for highland sheep marketing in North Shewa.

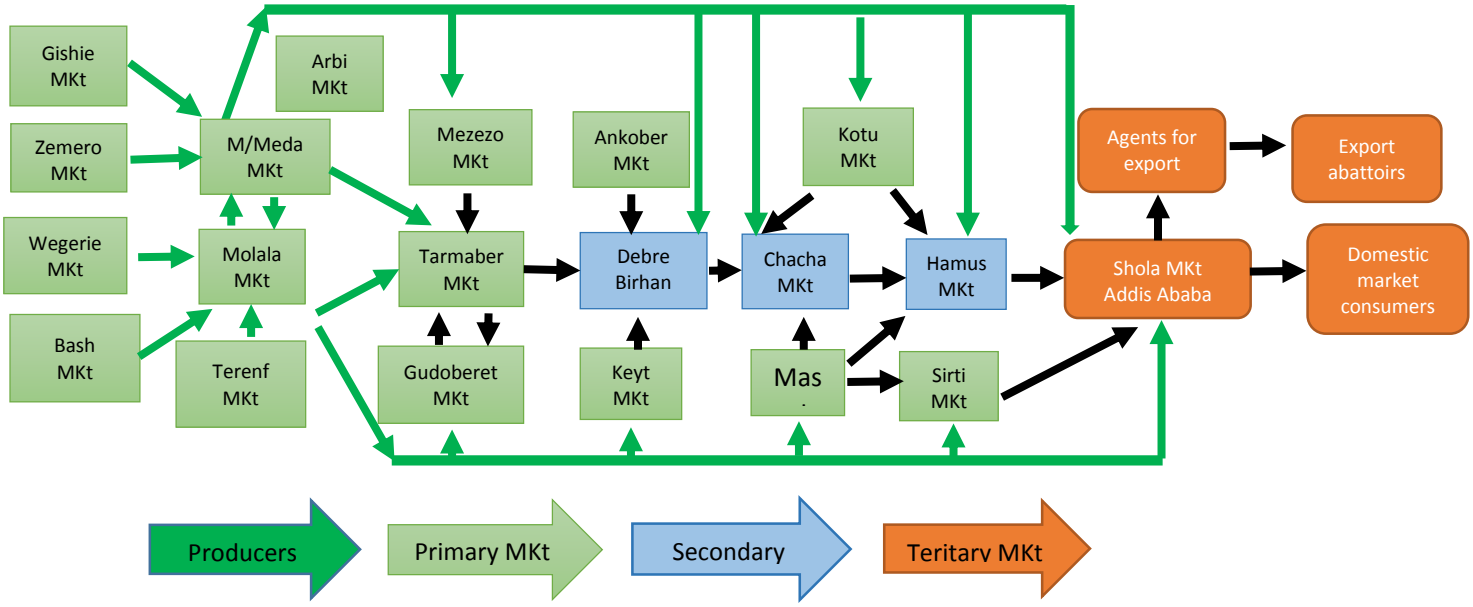

Figure 4. Sheep market routes in North Shewa connected to Addis Ababa

Marketing actors

Sheep pass successively through a number of market actors before reaching the end-users, representing a series of links in the value chain. The main in the study areas include

farmers/producers, brokers, collectors, small-scale traders, large-scale traders, butchers, supermarkets, individual consumers and meat exporters.

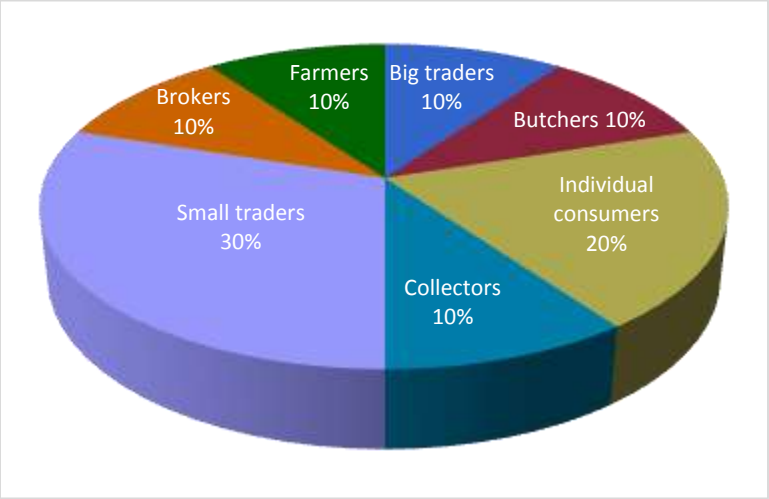

Figure 5. Proportion of sheep sold to different market actors

Producers

These are the first link in the sheep market chain. Their average flock size is 20 sheep per household. Farmers usually sell animals when they need cash to pay school fees, buy farm inputs, pay taxes, buy food during the summer seasons, healthcare, etc.

Rural collectors or 'middle men'

These actors collect sheep from the producers and sometimes from brokers and supply them to other actors, including consumers. Collectors have good experience in the market and can easily identify animals that are required by different users. They estimate weight by lifting the animals. They fix prices in the market and participate in a cartel with other collectors and traders so that no one gives higher prices, thus maintaining a relatively low price paid to the producers.

Brokers

Brokers help to organize transactions and obtain commission from sellers and buyers. They are not regulated and sometimes their actions are controversial. Farmers complain about their high commission charges, underhand behaviour and misinformation. Brokers may try to hinder transactions if they are not involved. However, traders who come from distant locations require guarantees from local brokers that there will be no disagreement after purchase of the animals (which could arise if they are sold by thieves or if the family does not agree to the sale). Brokers often know the sellers and buyers personally and so can usually negotiate in any dispute.

Small-scale traders

Traders buy sheep from producers, collectors and brokers at different markets. Small-scale traders operate mostly using their own capital and supply sheep to larger traders, butchers, hotels, restaurants and consumers.

Large-scale traders

Large-scale traders are in a superior position in terms of their available capital, information and facilities, such as holding areas. They usually buy sheep from smaller traders at the terminal markets and supply them to export abattoirs and butchers. Feed for the animals while they are being held is usually provided by the small-scale traders (e.g. a bale of straw for 15–20 sheep), but the large-scale traders pay the rent of the facility and labour costs.

Hotels and restaurants

Some hotels and restaurants buy sheep from producers, brokers and small-scale traders in the market, while others may have regular small-scale suppliers providing 10–15 animals a week. Hotels and restaurants usually buy mature female sheep since they believe females to have a better meat yield and because of the relatively low price. Hotels and restaurants also buy sheep meat from supermarkets in large towns and cities.

Consumers

Consumers are the last link in the sheep market chain. Households often purchase sheep during cultural and religious festivals. They buy sheep from producers, collectors, small-scale traders and brokers at their nearest markets, selecting animals based on their individual preferences (colour, tail size, horns, etc.).

Sheep butcheries and supermarkets

While there are no sheep butchers and meat supermarkets in the study area, they are found in large towns and cities, e.g. Addis Ababa. These butchers focus mainly on fattened, castrated sheep and goats of 40–45 kg live weight. The retail price offered by sheep butchers was around ETB 135/kg at the time of research. They buy animals from large- and small-scale traders.

Supermarkets buy animals of different live weights depending on their customers' needs. The animals are slaughtered in municipal slaughterhouses and the supermarkets butcher them at their own premises. They mainly buy male sheep of 40–45 kg live weight. In addition to selling packed meat to individuals via their retail outlets, supermarkets supply carcasses to restaurants and hotels on a contractual basis.

Export abattoirs

The export abattoirs buying animals from the study areas are located at Modjo, 155 km from the study area (e.g. Luna export abattoir). Large- and small-scale traders bring the animals to the factory gate (a minimum of 100 animals at a time) and the abattoirs slaughter up to 2000 sheep and goats a day, based on the availability of animals. Export abattoirs encourage larger traders so they can deal with fewer suppliers. Due to competition among abattoirs, the price per kg live weight has increased to ETB 32 for sheep in May 2012. Export abattoirs buy male (un-castrated) yearlings weighing 22 to 30 kg. They do not slaughter female animals.

Marketing channels

The distribution of marketing costs and margins can be illustrated by tracking some major marketing channels linking producers with end-users. These channels represent the full range of available outlets for sheep as they move from different collection points in production areas to terminal markets.

There are four major market channels for sheep produced in the study districts (Figure 6).
Channel 1: Sheep purchased by farmers for breeding/fattening
Channel 2: Sheep purchased by hotels and individual consumers in the study areas
Channel 3: Sheep transported to Addis Ababa hotels and consumer markets
Channel 4: Sheep slaughtered at Modjo export abattoirs

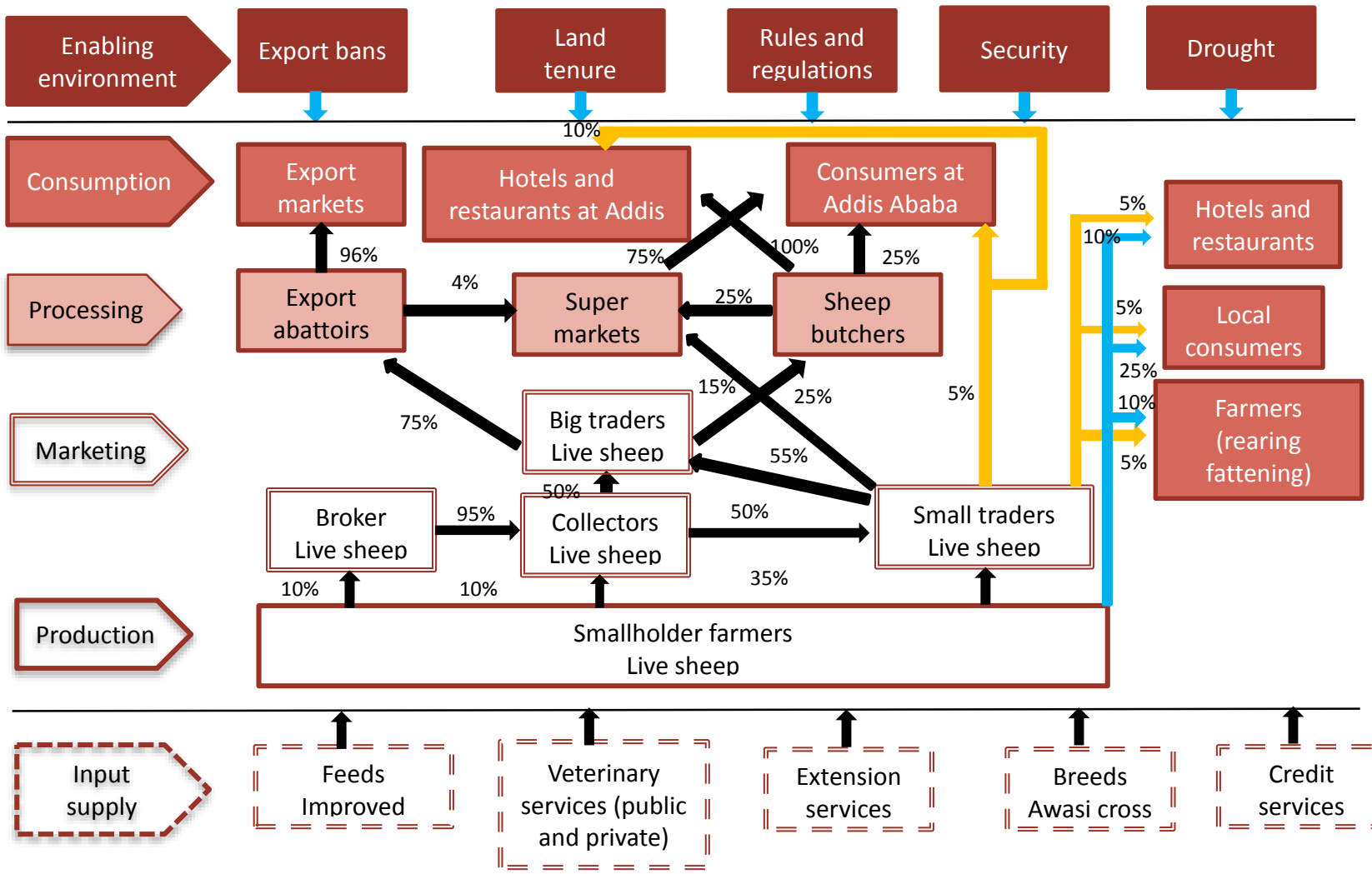

Figure 6. Sheep value chain in North Shewa connected to Addis Ababa

Channel 1: Sheep purchased by farmers for breeding and fattening
Sheep producers buy replacement breeding stock and sheep for fattening from the markets. They buy mostly from such known sources as neighbours and/or known traders on an appointment basis during the good season for feed. Farmers sell and buy animals of known origin, good physical appearance and good health. The main sellers are other farmers. However, collectors also collect animals of the required quality during the seasons when they expect a high demand.

Channel 2: Sheep purchased by hotels and individual consumers
Hotels in Debre Birhan, Chacha, Sheno and other towns usually buy mature female sheep. They prefer females to males because they are perceived to have better meat yield and fat cover than males. Hotels rarely slaughter male sheep. They buy either from their immediate markets or from surrounding markets through collectors who supply 10–15 sheep weekly. Collectors obtain a profit margin of ETB 20–30 per animal from such transactions.

Individual consumers (residents) buy slaughter animals mainly during such religious festivals as New Year, Meskel (the Ethiopian national holiday in September), Christmas, Easter and Muslim festival day (Arefa). These consumers tend to buy fattened mature sheep. Since they pay better prices than buyers for export abattoirs and hotels, producers prefer selling to them. Fattened male sheep that weigh about 35–50 kg can reach ETB 2200 (around ETB 44 per kg live weight) during the holidays and ETB 1600 (around ETB 32 per kg live weight) at other times. Individual consumers buy mostly from producers, brokers, collectors or small-scale traders.

Channel 3: Sheep transported to Addis Ababa butchers, supermarkets and consumer markets
Small-scale traders collect fattened mature males (mukit) and fattened sterile females (mesina) and transport them to the Addis Ababa market especially for the religious holidays. In addition to individual consumers, these animals are sold to sheep butchers and meat supermarkets. The butchers and supermarkets have permanent suppliers for live sheep. Traders transporting sheep to the final consumer markets have agents at Karra and Sholla (at the entry to Addis Ababa from the Dessie road) who sell the animals in the market. They feed them only for maintenance purposes until they are sold.

Channel 4: Sheep slaughtered at Modjo export abattoirs
This channel is the largest consumer of young, un-castrated male sheep and goats within a weight range of 22–30 kg. The export abattoirs buying sheep from the study area are located in Modjo town, 70 km south of Addis Ababa. They slaughter up to 2000 sheep and goats every day and export chilled carcasses to the Gulf States, mainly the Kingdom of Saudi Arabia and the United Arab Emirates. Sheep from the study districts are purchased by small-scale traders and delivered to the export abattoirs mainly through larger traders. Sheep from the highland market of North Shewa are also channelled to export abattoirs, it is difficult to ensure a sufficient supply from the study area for export markets, as the abattoirs purchase on a weight basis unlike individual consumers (live weight base) and individual consumers will pay a better price than the export markets.

Price setting

The majority of producers price their animals based on visual estimation. Animals are marketed on an individual basis and agreement on prices is reached after a long one-to-one bargaining process. Local and terminal traders and export agents are better informed of the demands and prices of animals and are decisive in the fixing of prices. Figure 7 shows how prices vary at different markets. The demand and supply of sheep varies with seasons, as shown in Table 2.

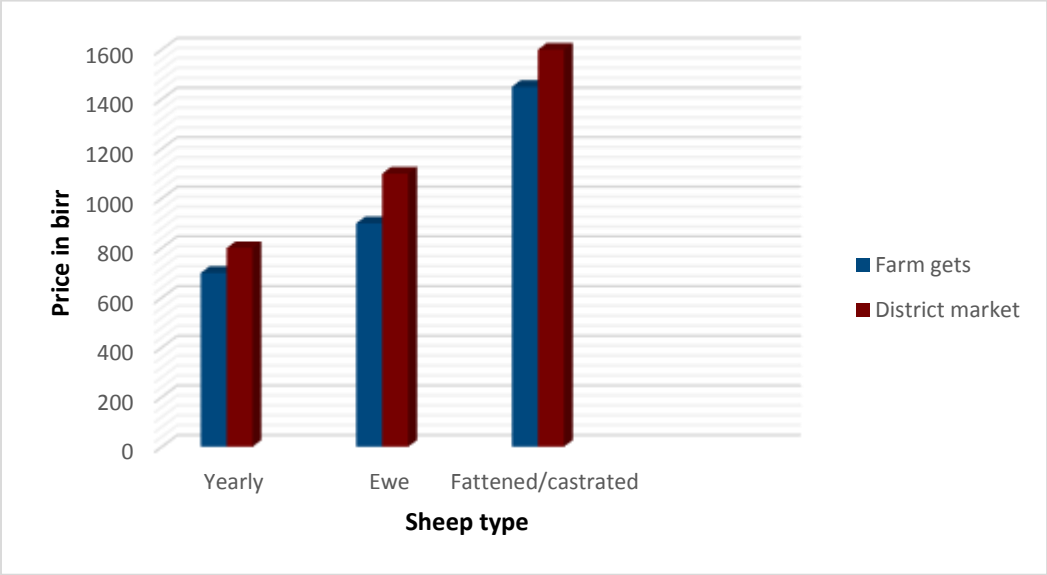

Figure 7. Price of sheep at different markets

Table 2. Yearly demand for and supply of sheep

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
High demand	H			HHH			H		HHH	HH		HHH
Low demand		LLL	LLL		L	LL		LL			L	
High supply	H			HHH	HH	H	HH		HHH	HH	H	HHH
Low supply		LL	LLL					LLL				

Note: H = high, HH = very high, HHH = extremely high; L = low, LL = very low, LLL = extremely low

Distribution of costs and margins

The study identified the major marketing costs of sheep and feed, from the producers to the different end-users. At each stage in the chain, the value of the product increases as the product becomes more suitable for end-users. However, at the lower end of the value chain, especially with the brokers, the price of the product increases without adding value to the product, because it is on the spot and one day marketing.

Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also

describe price differences between other points in the marketing chain, for example between producer and wholesale, wholesale and retail, prices (Scarborough and kydd, 1992). The size of marketing margins is largely dependent upon a combination of; the quality and quantity of marketing services, and the efficiency with which they are undertaken and priced. The quality and quantity of marketing services depends on supply and demand of marketing services and/or the degree of competition in the market place. The costs of service provision depend on both exogenous and endogenous factors and the efficiency are determined by the extent of competition between marketing enterprises at each stage.

Marketing costs and margin analysis is especially comparison of prices at different levels of marketing over the same period. Computing the total gross marketing margin (TGMM) is always related to the final price or the price paid by the end consumer and is expressed in percentage (Mendoza 1995).

$$\text{TGMM} = \frac{\text{Consumer price} - \text{Producer price}}{\text{Consumer price}} \text{ X } 100$$

It is use full to introduce here the idea of “producer participation”, gross marketing margin produces” (GMMp) which is the proportion of the price paid by consumer that belongs to the producer. Producer that act as a middle men also receive an additional marketing margin.

$$\text{GMMp} = \frac{\text{Price paid by the consumer} - \text{Marketing gross margin}}{\text{Price paid by the consumer}} \text{ X } 100$$

In marketing chain with only one trader between producer and consumer, the net marketing margin (NMM) is the percentage over the final price earned by the intermediaries as his/her net income once his marketing costs are deducted.

$$\text{NMM} = \frac{\text{Gross mrgin} - \text{Marketing cost}}{\text{Price paid by the consumer}} \text{ X } 100$$

Sheep costs and margins

The analysis of marketing costs was based on secondary data updated by additional data collected from the surveyed markets (see Table 3). The data for export abattoirs was presented as an aggregate value since their major cost is processing and packing. Transportation is the major cost for small-scale traders supplying sheep and goats to export abattoirs, butchers and supermarkets, followed by the cost of feed and tax (to the municipality). Personal travel costs, taxes and transportation are the major costs for collectors. The main costs for large-scale traders are housing and search costs. Search costs include buying through different agents and make financial arrangements. However, these costs relative to the overall costs of the animal are negligible.

Large-scale traders simply collect commission on the number of animals submitted to the export abattoirs in their name. However, when small-scale traders hand over animals to larger traders at secondary markets, the major cost for the large traders is for transporting and feeding the animals. The significance of transportation costs in the sheep and goat value chain underlines its role in competitiveness among the different businesses. This calls for policymakers to facilitate the development of a more cost-effective livestock transportation system, although a more regulated system would probably be more costly.

Table 3. Sheep marketing costs (ETB) and their contribution to overall marketing price (%) for different market participants

Cost category	Channel to export market								Channel to butchers and supermarkets									
	Export abattoirs		Small-scale traders		Large-scale traders		Rural collectors		Butchers		Larg-scale traders		Supermarkets		Small-scale traders		Rural collectors	
	costs	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost	costs/head (ETB)	% of total cost
Feed cost			2.00	11.2	0.00	0.0	3.00	29.3	8.10	13.4	0.00	0.0	5.00	5.2	2.00	11.2	3.00	29.3
Veterinary cost			0.25	1.4	0.00	0.0	0.25	2.4	0.10	0.2	0.00	0.0	0.10	0.1	0.25	1.4	0.25	2.4
Barn cost/rent			0.25	1.4	1.00	66.7	0.25	2.4	2.50	4.1	1.00	66.7	2.50	2.6	0.25	1.4	0.25	2.4
Water & electricity			0.25	1.4	0.00	0.0	0.00	0.0	3.00	5.0	0.00	0.0	3.00	3.1	0.25	1.4	0.00	0.0
Labor			0.60	3.4	0.00	0.0	0.25	2.4	30.00	49.6	0.00	0.0	25.00	26.2	0.60	3.4	0.25	2.4
Search cost			0.00	0.0	0.50	33.3	0.00	0.0	5.00	8.3	0.50	33.3	5.00	5.2	0.00	0.0	0.00	0.0
Processing, packaging & labelling	87	100	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	50.00	52.3	0.00	0.0	0.00	0.0
Transportation cost			10.00	56.0	0.00	0.0	4.00	39.0	5.00	8.3	0.00	0.0		0.0	10.00	56.0	4.00	39.0
Total Tax payment			2.00	11.2	0.00	0.0	1.00	9.8	5.00	8.3	0.00	0.0	5.00	5.2	2.00	11.2	1.00	9.8
Combiner cost			0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		0.0	0.00	0.0	0.00	0.0
Loading/unloading			1.00	5.6	0.00	0.0	0.00	0.0	1.80	3.0	0.00	0.0		0.0	1.00	5.6	0.00	0.0
Other costs			1.50	8.4	0.00	0.0	1.50	14.6	0.00	0.0	0.00	0.0		0.0	1.50	8.4	1.50	14.6
Total (birr/head) or %	87	100	17.85	100	1.50	100	10.25	100	60.50	100	1.50	100	95.60	100	17.85	100	10.25	100

While the maximum Freight on Board (FOB) export price at Bole airport is 5.50 US Dollars per kg or ETB 98/kg, the domestic sheep meat price is ETB 135/kg. Export abattoirs are therefore selling at a lower price than the domestic market. However, they are also exporting offal, including kidneys, hearts, intestines, testicles, penises and brains. Thus, in order to be competitive in the export market, they try to beat their competitors in the supply market. One of their strategies is to reduce their rate of procurement in the highland areas during holidays when highland sheep are in high demand. The analysis of costs and margins along the different sheep marketing channels also shows that the proportion of the final sheep price obtained by producers was 59% from export abattoirs, 64% from butchers and 67% from supermarkets (Tables 4, 5 and 6, summarized in Table 7).

Table 4. Costs and margins per head of sheep destined for export markets

	Producers	Brokers	Rural collectors	Small traders	Large-traders	Export abattoirs
Selling price	800	850	950	1000	1025	1360
Marketing cost	-	0	10	18	2	87
Marketing margin	-	50	150	50	25	335
Net margin	-	50	140	32	24	248
Producer's share of final price (%)	-	-	-	-	-	59

Table 5. Costs and margins per head of sheep destined for butchers

	Producers	Brokers	Collectors	Small traders	Large traders	Butchers
Selling price	1450	1500	1485	1625	1700	2280
Marketing cost	-	0	10	18	2	61
Marketing margin		50	-15	140	75	580
Net margin		50	-25	122	74	520
Producer's share of final price (%)		97	98	89	85	64

Table 6. Costs and margins per head of sheep destined for supermarkets

	Producers	Brokers	Collectors	Small traders	Supermarkets
Selling price	1200	1250	1350	1550	1795
Marketing cost	-	0	10	18	96
Marketing margin	-	50	150	200	245
Net margin	-	50	140	182	149
Producer's share of final price (%)	-	96	89	77	67

Table 7. Summary of costs and margins per head of sheep destined for different marketing channels

	Export abattoirs	Butchers	Supermarkets
Producers' selling price	800	1450	1200
Final selling price	1360	2280	1795
Marketing cost	87	61	96
Marketing margin	335	580	245
Net margin	248	520	149
Producer's share of final price (%)	59	64	67

Constraints in the sheep value chain

Constraints in input supply

Lack of improved rams

Farmers in the study areas have no alternative other than to use local rams. While they are well adapted to the adverse conditions found in the area, they also maintain low rates of productivity in the local breeds.

Shortage of forage seeds

There is also a shortage of forage seeds in the area. Farmers are using oat seeds either from their own stock or by buying from the market. There is a general shortage of other forage crops. It is difficult to find forage seeds in the market.

Limited access to credit

While such micro-finance institutions as Amhara Credit and Saving Institution and Wisdom Micro-finance are present in the study area, farmers have limited access to credit, mainly because of high interest rates and requirements for group collateral. Farmers are generally unwilling to be involved in group collateral schemes because they are worried about paying the debts of defaulters.

Inadequate facilities at animal health centres

Veterinary services are provided in the study area by veterinary clinics and animal health posts organized under the office of agricultural development/livestock agency. At the time of this assessment, one health post was serving three kebeles. However, only one health technician is available at each centre, where they are required to do all activities, including administration. The health posts are therefore short of human resources. In addition, they often have a shortage of drugs and clinical equipment. Above all, the technicians have no transport and are unable to reach farmers in the furthest locations and those who cannot bring their animals to the health posts. This shortage of funds and facilities means that animals may die unnecessarily.

Production constraints

Low feed quality

Sheep production in the study area is based on free grazing of natural pasture. Feed supplementation is uncommon, although a few farmers provide their sheep with crop residues. However, such crop residues as barley and wheat straw are very poor nutritionally and farmers are not treating them with urea to improve the quality. Concentrates are also seldom fed.

Low performance of local breed

As indicated above, the major breed available in the study area is the local Menz breed. These animals usually have a slim body condition and fetch low market prices. According to the focus group discussions, farmers would like to introduce better performing breeds or cross-breed to improve the Menz breed.

High incidence of diseases

In the study area, there is high incidence of foot rot, fasciola, pasteurellosis, sheep pox and mange mites. Given the critical shortage of veterinary technicians, drugs and equipment at the

health posts and clinics, these diseases significantly affect the productivity of animals in the area.

Inadequate training

Farmers in the area use traditional methods of sheep feeding, health care and housing. Farmers have no access to training on how to improve their skills and knowledge in sheep husbandry practices.

Lack of sheep market extension services

The extension system is expected to be the major source of agricultural information and knowledge for the farmers. However, there is poor access to knowledge on how to improve production and delivery and where and when to sell sheep and feed products.

Marketing constraints

Lack of reliable market information

There is no formal source of market information about sheep and feed prices in the study areas. Traders get information from friends and other traders. Farmers rely on the last week's market price information obtained from neighbouring farmers or market supervisors.

Poor livestock marketing infrastructure

Based on information obtained from interviews and marketplace observations we deduce that most local markets have poor infrastructure, with no fenced yards, clinics, weighing scales, water supplies, feeding troughs, loading and unloading ramps and toilets. On market day, whether the animals are sold or not, the chance of them getting fed and watered is small. During the rainy season, mud is a problem and there is no drainage. There is no regular feed market in the study area. Local feed traders buy crop residues and oat millings from farmers and sell them to the local town.

Lack of feed storage

Lack of feed storage is a major problem, especially during the rainy season. Farmers lose significant amounts of crop residues due to exposure to rain. Traders buy crop residues from the farmers, load it into sacks and transport it immediately to the town. Crop residue traders consider this trading as part-time work and do not realize the importance of storage.

High cost of transportation

Transport costs are high because of the rough road network in the area. This inflates the price of the animals in the terminal markets, making them uncompetitive when compared with sheep coming to terminal markets from other areas.

Unlicensed (informal) traders and brokers

Most of the traders in the livestock markets are informal operators who have no trade licence. Most of them are opportunistic and see sheep trading as a side-line business, looking for maximum benefit, often at the expense of the farmers. Thus, they do not have a proper sense of responsibility or accountability in their business operations. Formal business operators are discouraged since they have to compete with informal operators who do not pay tax.

Seasonality in supply and demand for sheep

Sheep supply in the study areas is higher during the holidays and when the households need money to purchase seed, fertilizer and other crop inputs. This is mainly because households use sheep as sources of income to cover their immediate cash expenditure. Thus, farmers in the study area mostly sell their animals during holidays and following some seasonal patterns, depending on their financial problems.

Processing constraints

Inadequate local market (customer)

Processing in the study area is carried out by hotels, restaurants and butchers. However, in this rural area, there are only a few consumers who use butchers and not many hotels. Since meat is consumed mostly at holiday times, this limits the market for processing.

Low quality animals

One of the opportunities open to farmers in the study areas is selling their animals to the export market, with a new market opened recently in Bahrain, where consumers have developed a taste for Menz sheep meat. However, since farmers have little knowledge of this market, they are unable to supply animals of suitable quality. The abattoirs need young, un-castrated, yearling males with good body condition.

Constraints at the consumption stage

Inconsistent supply of animals

This constraint is related to the seasonal availability of feed and lack of improved sheep fattening skills in the area. Sheep rearing in the area is mainly on free grazing of natural pasture and animals are fattened by feeding for over a year after castration. Thus, it is difficult to get animals of good body condition throughout the year and export abattoirs and butchers are facing difficulties obtaining animals to suit their requirements.

Institutional and organizational constraints

Multiple taxation

Taxes are collected per head of animals in the market yard regardless of whether the animal is sold or not. There is double taxation of the same animal as it crosses checkpoints to reach terminal markets. For example, sheep traders buying sheep from Hamus Gebey pay tax at the market gate and another ETB 100 per truck when they cross Legetafo.

Lack of sheep marketing cooperatives

We found no cooperatives or other form of association for sheep and feed marketing. Agricultural cooperatives in the area provide only fertilizers and crop seed to their member farmers. This means there is no horizontal linkage of farmers in the area that can help to boost their bargaining power. Farmers are selling their animals on an individual basis and face the marketing challenges on their own. Since they have no longstanding relationships with traders, they also lack vertical linkages with other actors in the value chain.

Opportunities

Government support to increase meat exports

In its five-year Growth and Transformation Plan, the Government of Ethiopia aims to increase meat exports to 110,000 tonnes in 2015 (MoFED 2010). The government envisages earning USD 1 billion from the export of meat and live animals by this time. Thus, it is committed to supporting the private sector involved in the export of these commodities. This could create better market opportunities for sheep producers.

Increasing demand for sheep meat in local markets

The growing human population and urbanization has had a considerable impact on patterns of food consumption in general and demand for livestock products in particular. There is high demand for sheep meat in local markets because of the expansion of restaurants, hotels and butchers. The attitude of the consumer is leading to a change towards a more meat-focused diet, especially in large towns and cities. Consumers have also realized that highland Menz sheep meat has certain unique taste characteristics. The projected increase in the demand for livestock products has important implications for the livestock feed industry, with growing demand for energy and protein raw materials.

Growing export demand

The demand for meat is growing in the Middle East, where sheep meat is preferred. The Government of Ethiopia is also encouraging meat export, creating good market opportunities for sheep producers.

Livestock Development and Health Agency

Amhara Regional State is focusing on developing the livestock sector due to its high resource potential. Amhara region has established a livestock agency under the Bureau of Agriculture in order to provide the necessary support. This could help in increasing the supply of such inputs as improved breeds and forage seeds.

Shift in production/specialization

The area is known for livestock production and it is delineated as part of a livestock growth corridor by the regional government. The major livestock opportunities in the corridor include beef and sheep production and dairy operations. Although the area is characterized by mixed crop–livestock production, crop farming is becoming difficult due to soil infertility, waterlogging, frost and land degradation. This creates a good opportunity for sheep and feed production.

Fattening practices

Sheep fattening is becoming one of the most important livestock production activities in the highlands of North Shewa. There is therefore a need for higher volumes and better quality feeds. This may increase the demand for feed as well as stimulating the development and growth of feed markets.

Farmers awareness increasing

In the past, farmers had limited awareness about animal and animal feed production. Currently, emphasis is being given to livestock and feed production by the government and farmers are taking training on how to manage their animals.

Transport access to the main market

Transport access is one of the most important constraints for sheep and feed trading. Traders transport their sheep directly to the terminal markets (using Isuzu trucks). The improving road network therefore represents an opportunity. Improvement in transport infrastructure may also reduce operational costs for businesses and thus encourage the entry of potential traders who may help push up prices through price competition, thereby also increasing demand.

Increasing export abattoirs

In addition to the existing export abattoirs, the construction of new ones in the region and around Addis Ababa creates good opportunities for sheep traders and farmers.

Conclusions

Farmers normally sell their sheep and goats when they need cash to meet household expenses, settle social obligations and purchase food during a drought. Coping strategies to alleviate food shortages during severe droughts need to be devised to ease pressure on these livestock enterprises. If they were not under pressure to sell at certain times, farmers would be able to keep their best quality animals for breeding and so improve the production performance of their flocks and herds.

Farmers currently fatten some sheep for household consumption and for sale; traditionally this involves an extended period of time and a large supply of inputs. The strong seasonality of demand for sheep presents an opportunity for farmers to focus more on short-term fattening to produce animals in the appropriate condition to coincide with periods of peak prices. Smallholders also need new knowledge to enable them to improve the management and storage of crop residues and grow additional, good quality supplementary feed for their livestock, e.g. forage legumes.

Challenges and suggested interventions at different stages of the value chain and 'best bet' research and development intervention strategies are summarized in the Annex tables.

Recommendations

Based on the findings of this study, we would like to make the following recommendations to government policy- and decision-makers, donors and the wider development community:

1. Support genetic improvement of the Menz sheep breed based on other experience of community-based breeding programs.
2. Support improvement in feed availability and feeding practices in the area through:
   - Timely delivery of forage seed
   - Improving forage seed production practices
   - Providing training on improved sheep feeding practices to farmers and extension agents
   - Regenerating grazing land
   - Maintaining optimum size and productive sheep flocks
   - Sowing grasslands with improved varieties
   - Introducing and supporting crop residue pre-treatment to improve feed value
   - Developing improved forage varieties
   - Training farmers and District Agents (DA) in such improved feeding methods as best or least cost ration formulation, strategic feeding and supplementation with feed of higher nutritive value.
3. Support improved animal health delivery through:
   - Encouraging the regional livestock agency to hire more veterinary technicians and providing in-service training to existing technicians
   - Providing technical support for the establishment and proper running of a veterinary drug revolving fund (already approved by the regional government)
   - Allocating budget for procurement of veterinary equipment for the health posts and clinics
   - Procurement of motor bikes and mules to facilitate mobile serves for veterinary technicians
   - Providing regular vaccination programs and treatment for major diseases in the area
   - Training more community animal health workers for remote villages
4. Strengthen credit and savings associations in terms of finance and management. This may need provision of seed money and training of their leaders in cooperative management.
5. Link with the National Livestock Market Information System to collect market information, conduct analysis and disseminate the information. Diversify mechanisms of information dissemination and delivery.
6. Support construction of well-designed livestock marketing yards with all the necessary facilities. Encourage and support enforcement of government rules and regulations on business registration and licensing. This may involve coaching the market operators and taking action on unlicensed actors.
7. Support the creation of multi-stakeholder platforms involving federal, regional and local administrators, customs authorities, traders and other stakeholders to discuss cross-cutting issues and negotiate solutions. These platforms could serve as forums to strengthen market linkages.

8. Support provision of training on sheep production and management for producers, DAs and District extension subject matter specialists.
9. Organize training on efficient and hygienic slaughtering and meat handling for workers at municipal abattoirs, hotels, restaurants and butchers.

Annex 1. Challenges and interventions at different stages of the value chain

Stages of value chain	Challenges	Suggested interventions	Implementers	Time horizon
Input supply	Shortage of improved rams	Community-based genetic improvement	- District Office of Agriculture - DBARC - ICARDA/ILRI, farmers	medium term
	Shortage of forage seeds	Timely delivery of seed Improved seed production	- District Office of Agriculture - DBARC, farmers	Short term
	Shortage of drugs	Provision of revolving fund for drug purchases	- District Office of Agriculture - ICARDA/ILRI	Short term
	Shortage of manpower, equipment and transportation at vet health posts	Strengthen health posts (manpower, vet equipment, transportation)	- District Office of Agriculture - ICARDA/ILRI	Short term
	Credit - high interest, group collateral	Strengthen credit and savings associations in terms of finance and management	- District Office of Agriculture - District Cooperatives Promotion Office - ICARDA/ILRI	Short term
	Land shortage	Renovation of grazing land, feed development, maintaining optimum and productive sheep flocks	- District Office of Agriculture - DBARC	Medium term

Stages of value chain	Challenges	Suggested interventions	Implementers	Time horizon
Production	Poor feed quality	Over-sow with improved varieties, crop residue pre-treatment, supplementation, developing improved forage varieties	- District Office of Agriculture - DBARC - Farmers	Short term
	Diseases (fasciola, pasteurellosis and sheep pox)	Provision of regular vaccination and treatment Strengthen health posts Train CAHWs for remote villages	- District Office of Agriculture - DBARC - ICARDA/ILRI, farmers	Short term
	Traditional feeding practices	Train farmers and DAs in improved feeding methods such as best/least cost ration formulation and strategic feeding	- District Office of Agriculture - DBARC - ICARDA/ILRI	Short term
	Low performance of local breed	Promote community-based genetic improvement program	- District Office of Agriculture - DBARC - ICARDA/ILRI	Medium term

Stages of value chain	Challenges	Suggested interventions	Implementers	Time horizon
Marketing	Lack of reliable market information	Link with National Livestock Market Information System and Devise mechanisms of delivery system	- District Office of Agriculture - District Cooperatives Promotion Office ▪ DBARC ▪ ICARDA/ILRI	Medium term
	Poor livestock marketing infrastructure - Poorly constructed marketing yards - Lack of facilities: vet clinics, watering and feeding troughs, loading and unloading ramps and toilets	Construction of well-designed livestock marketing yards with all necessary facilities	- Amhara Bureau of Agriculture - District administration - District Cooperatives Promotion Office	Long term
	High cost of transport due to rough road network	Road development	Amhara Regional Government (road authority)	Long term
	Unlicensed (informal) traders and brokers negatively influencing the proper marketing environment	Enforce government rules and regulations on business registration and licensing. Coach market operators and take action on unlicensed actors	District Office of Customs and Revenue District Office of marketing and cooperative	Short term

Stages of value chain	Challenges	Suggested interventions	Implementers	Time horizon
	Double taxation	Create multi stakeholder platforms involving federal, regional and local administrators, customs authorities, traders and other stakeholders to discuss cross-cutting issues and negotiate solutions	Federal and regional customs and revenue authorities Regional bureaus of agriculture and livestock agencies ICARDA/ILRI (facilitation)	Short term
	Inadequate training (skills and knowledge) on sheep production and marketing	Provide training on sheep production and management for producers, DAs and District SMSs	- District Office of Agriculture - DBARC - ICARDA/ILRI	Short term
Processing	Inadequate local market (customers)	Training in efficiency and hygiene Search for new markets	District Office of marketing and cooperative	Short term
Consumption	Low quality animals supplied to the market	Awareness creation, introducing and strengthening community based sheep improvement programs.	- District Office of Agriculture - DBARC - ICARDA/ILRI	Medium term
	Inconsistent supply of animals	Improve linkages among the sheep value chain actors Improving the production and productivity of sheep through community-based sheep improvement program	- District Office of Agriculture - DBARC - ICARDA/ILRI	Medium term

Annex 2. 'Best bet' development interventions

Activities	Who	When	How
Provision of regular vaccination and treatment	- District Office of Agriculture - DBARC/ ICARDA/ILRI	Short term	Planned vaccination
Strengthen health posts	- District Office of Agriculture	Short term	Maintenance of health post buildings and equipment provision
Involve CAHWs in animal health	- District Office of Agriculture - DBARC/ farmers	Short term	Participatory selection of CAHWs from the community Training Supply of equipment to CAHWs Initial capital provision
Introduce improved forage integrated with the development of existing water and shade	- District Office of Agriculture - DBRC and ICARDA/ILRI	Medium term	Identify suitable forage using a participatory approach
Introduce improved grazing land management	- District Office of Agriculture - DBRC and ICARDA/ILRI	Medium term	Design feasible grazing management

Activities	Who	When	How
Intervention on mange and sheep pox control	- District Office of Agriculture - Livestock agency - DBRC and ICARDA/ILRI - Farmers	Short term	Prepare health care guidelines Training for farmers on animal husbandries
Create multi stakeholder platforms to discuss cross-cutting issues and negotiate solutions and policy	- District Office of Agriculture - DBRC and ICARDA/ILRI	Short term	Workshop
Inspection and certification of markets and food establishments	- District Office of Agriculture - Livestock agency - Health office - Trade and transport - ICARDA/ILRI	Short term	Monitoring
Develop infrastructure	- District Office of Agriculture - Livestock agency - Trade and transport - ICARDA/ILRI	Medium term	Budget allocation

Annex 3. ‘Best bet’ research interventions

Activities	Who	When	How
Demonstration of oat and vetch production	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Farmers’ group formation
Demonstration of pre-treatment of crop residues	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Farmers’ group formation
Study on productivity and carrying capacity of grazing land	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Study on carrying capacity and resource use efficiencies
Adaptation trials of new forage varieties	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Conducting adaptation trials
Study on adaptability of tree lucerne at Menz	- District office of agriculture - DBRC and ICARDA/ILRI	Medium term	Conducting adaptation trials
Demonstration of cenorosis control methods	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Participatory deconstration
Optimization of community based breeding program	- District office of agriculture - DBRC and ICARDA/ILRI	Long term	Selection on female side
Estimation of genetic gain	- District office of agriculture - DBRC and ICARDA/ILRI	Long term	Conducting research

Activities	Who	When	How
Recoding and sharing estimated breeding value	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Information dissemination
Intensity of selection and selection traits	- District office of agriculture - DBRC and ICARDA/ILRI	Long term	Conducting research
Study on market information delivery systems	- District office of agriculture - DBRC and ICARDA/ILRI	Short term	Connecting National Livestock Marketing Information System
Development of market linkages	- District office of agriculture - DBRC and ICARDA/ILRI	Long term	Conducting research on linkage and organizing and provision of training for market actors
Assessment of microbiological quality of meat	- DBRC and ICARDA/ILRI	Long term	Conducting research

Note: it is assumed that time frames range for short-term 1 – 2 years, medium term 3 – 5 years and long term greater than 5 years

References

EARO (Ethiopian Agricultural Research Organization). 2000. National Small Ruminants Research Strategy Document. Addis Ababa, Ethiopia: EARO.

Ehui, S.K., Benin, S. and Nega Gebreselassie. 2000. Factors affecting urban demand for live sheep: The case of Addis Ababa, Ethiopia. Socio-economics and Policy Research Working Paper 31. Nairobi, Kenya: International Livestock Research Institute.

IBC (Institute of Biodiversity Conservation). 2004. The State of Ethiopia's Farm Aanimal Genetic Resources: Country Report. A Contribution to the First Report on the State of the World's Animal Genetic Resources. Addis Ababa, Ethiopia: IBC.

Mendoza, G., 1995. A primer on marketing channels and margins. P257-275.In G.J. Scott (eds). Prices, Products, and people; Analyzing Agricultural markets in Developing Countries. Lynne Rienner Publishers, Boulder, London.

MoFED (Ministry of Finance and Economic Development). 2010. Growth and Transformation Plan (GTP) 2010/11 – 2014/15. Addis Ababa, Ethiopia: MoFED.

Scarborough, Vanessa and Kydd, 1992. Economic Analysis of Agricultural market: A Manual Marketing Series 5, Chatham. UK: Natural Resource Institute. 172p.

Shapiro, K. 1991. Assessment of animal agriculture in Africa: Economic issues. Morrilton, Arkansas, USA: Winrock International Institute for Agricultural Research.